

Bachelor of Science in Electrical Engineering

كلية العلوم والهندسة
College of Science & Engineering
جامعة حمد بن خليفة
HAMAD BIN KHALIFA UNIVERSITY



Bachelor of Science in Electrical Engineering

The Electrical Engineering program offers a comprehensive approach that blends theoretical foundations with practical applications. This approach equips students to tackle contemporary challenges in areas such as information, communication, computing, power, and electrical systems.

With an emphasis on collaborative education, training, research, and capacity-building, the program aims to prepare adaptable engineers, capable of meeting society's evolving needs and embracing leadership, social consciousness, integrity, and ethics.

Mission statement

The Electrical Engineering Program at Hamad Bin Khalifa University aims to:

- ▶ Provide students with quality education that is well-grounded in the fundamental principles and engineering practices that prepare them for the real world.
- ▶ Empower students with the knowledge, skills, and professional attributes that enable them to become leaders in their future endeavors.
- ▶ Serve the industry, government agencies, and local community in Qatar through targeted outreach activities, innovative consulting, and research solutions.

Program structure

The curriculum starts with a strong foundation in mathematics, physical sciences, and computing, ensuring students understand the core principles of electrical engineering. As they progress, they will delve into specialized areas such as electric energy systems, telecommunications, electronics, and computing systems.

Hands-on projects, laboratory experiments, and industry collaborations offer practical insights into the analysis and design of complex systems, preparing students for future career challenges.

The program emphasizes flexibility and interdisciplinary learning, allowing students to customize their education to align with their interests and career goals. As such, students must take at least two courses from their chosen concentration and at least one course from another technical area:

- ▶ Power and Energy Systems
- ▶ Communications and Signal Processing
- ▶ Embedded and Intelligent Computing Systems

These concentrations provide in-depth expertise, equipping students with the skills needed to excel in these fields.

Beyond technical skills, faculty emphasize teamwork, communication, and critical thinking. Through collaborative projects, internships, and experiential learning opportunities, students will learn to approach problems from multiple perspectives and develop innovative solutions.

Curriculum

A full-time program, taught in English over four years, comprising:

- ▶ General educational courses (in humanities, history, business, and creative arts)
- ▶ Mathematics and science courses
- ▶ Core electrical engineering courses
- ▶ Core curriculum electives
- ▶ General engineering electives
- ▶ English communication electives

Learning pathways

The Electrical Engineering program helps students tailor their education through three pathways that each leverage the strengths of HBKU's research institutes, the Qatar Foundation multiversity ecosystem, and partner universities:

- ▶ **Professional Pathway:** This pathway prepares students for careers in industry, focusing on the application of AI technologies. Students gain experience through internships, co-op programs, and industry projects, becoming professionals ready to utilize AI in engineering roles.
- ▶ **Innovation and Research Pathway:** This pathway develops students' research skills with an emphasis on AI research. Students have the opportunity to work on research projects with faculty in HBKU's research institutes. They also participate in undergraduate and graduate-level research, attend conferences, and contribute to academic publications.
- ▶ **Entrepreneurship Pathway:** This pathway prepares students to launch their own ventures. Students learn business management, startup development, and innovation strategies. They connect with mentors, incubators, and resources through the university and Qatar Foundation, including Qatar Science and Technology Park, to develop their business ideas.

These pathways allow students to align their education with their specific career goals. This contributes to the college's aim to prepare future leaders with entrepreneurial mindsets that shape novel solutions for positive, global impact.

Program objectives and outcomes

Program educational objectives

The objectives of the Electrical Engineering program at Hamad Bin Khalifa University are for graduates to:

- ▶ Demonstrate success as electrical engineers across diverse career paths while upholding high ethical standards.
- ▶ Engage actively in professional and community service at local and global levels.
- ▶ Show continuous improvement through pursuing graduate studies, continuing education, and professional development in their discipline or other fields.
- ▶ Continue developing effective teamwork, communication, and leadership skills.

Student outcomes

- ▶ An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- ▶ An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- ▶ An ability to communicate effectively with a range of audiences.
- ▶ An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- ▶ An ability to function effectively on a team whose members provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- ▶ An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- ▶ An ability to acquire and apply new knowledge using appropriate learning strategies.

Study plan

The Electrical Engineering program consists of 129 credits, designed to progressively deepen the knowledge and skills of students in electrical engineering, from general scientific principles to advanced and specific engineering topics. It prepares students for both professional careers and academic advancements, incorporating a mixture of theoretical knowledge and practical applications.

Admission and application requirements

Applicants seeking admission to the Bachelor of Science in Electrical Engineering should have a strong high school academic record with evidence of advanced coursework in math and science. Applicants are required to take the IELTS or TOEFL exam in order to demonstrate their proficiency in the English language. Applicants are highly encouraged to take the SAT or ACT exam.

Application requirements

A completed online application form:
admissions.hbku.edu.qa

Academic transcripts

Final transcripts of all high school years (grades 10, 11, and 12) that are available at the time of application. Transcripts in languages other than Arabic or English must be accompanied by an official translation. Applicants should submit a copy of their high school transcripts as part of the online application. Applicants who are admitted to the program based on copies of or incomplete transcripts will be required to provide original transcripts upon enrollment in order to register for classes.

Standardized test results

Official copies of standardized test results must be sent directly to HBKU. Please refer to the institutional codes below:

▶ SAT: 7675

▶ TOEFL: 4981

- ▶ ACT: 7019
- ▶ IELTS: No code required. Students should ask the IELTS center where they tested to send the IELTS TRF to Hamad Bin Khalifa University.

Applicants should also submit copies of their test scores as part of the online application.

Letters of recommendation

Applicants should provide two letters of recommendation, including one from the school counselor, and one from a math or science teacher. Applicants should include their referees' names and email addresses in the online application. Referees will receive an email requesting them to complete their references.

Personal statement of interest

Applicants should submit a personal statement as part of the online application. The personal statement should explain why the student is applying for the undergraduate major in Electrical Engineering, and how this will contribute to their future goals (minimum of 300, maximum of 500 words).

Resume/Curriculum vitae

Applicants should submit their resume or CV as part of the online application, including academic and extracurricular achievements, such as honors, awards, leadership, volunteer work, athletic involvement or any other relevant activities. Applicants are highly encouraged to mention hobbies and personal talents as well.

Identification document

All applicants should submit an electronic copy of their passport as part of the online application. Nationals and Residents of Qatar should also submit their valid Qatari ID.

Student funding

For information about student funding opportunities, please visit: <https://www.qf.org.qa/education/higher-education/financial-aid>